What is claimed is:

1. A thermoelectric module comprising:

a pair of substrates, wherein at least one of the substrates is a flexible substrate;

a plurality of electrically conductive contacts disposed on opposing faces of said pair of substrates; and

a plurality of P-type and N-type thermoelectric elements interposed between said pair of substrates, each of said plurality of conductive contacts connecting adjacent P-type and N-type thermoelectric elements to each other in series and wherein each of said P-type and N-type elements has a first end connected to one of said conductive contacts of one of said substrates and a second end connected to one of said conductive contacts of the other of said substrates.

2. The module of Claim 1 further comprising a thermally conductive layer disposed on an outside surface of each of said pair of substrates.

3. The module of Claim 2 wherein said thermally conductive layer has a thickness that allows the flexible substrate to remain flexible.

4. The module of Claim 2 wherein said thermally conductive layer forms a plurality of thermally conductive contact points that spatially coincide with the areas

covered by said plurality of conductive contacts on said opposing faces of said pair of substrates.

5. The module of Claim 1 wherein said conductive contacts are thicker than said conductive layer.

6. The module of Claim 5 wherein said conductive contacts have a thickness equal to or greater than 0.003 inch.

7. The module of Claim 6 wherein said conduct contacts have a thickness of about 0.012 inch.

8. The module of Claim 1 wherein said flexible substrate has a dielectric strength of about 500 V or more.

9. The module of Claim 1 wherein said flexible substrate is selected from the group of materials consisting of polyimide and epoxy resin.

10. The module of Claim 1 wherein said plurality of conductive contacts have a thickness sufficient to permit said module to operate using currents in the range of about 6 amps to about 15 amps.

11. The module of Claim 2 wherein said flexible substrate has a thickness sufficient to provide electrical insulation between said plurality of conductive contacts and said conductive layer and to provide thermal conductivity between said plurality of P-type and N-type elements to said conductive layer.

12. The module of Claim 11 wherein said flexible substrate has a thickness in the range of about 0.0005 inches to about 0.002 inches.

13. The module of Claim 1 further comprising a diffusion barrier between said plurality of conductive contacts and said first and second ends of said plurality of said P-type and N-type elements.

14. The module of Claim 13 wherein said diffusion barrier is made of a material selected from the group consisting of nickel, a titanium/tungsten mix, molybdenum, and other known diffusion barrier materials.

15. A thermoelectric module comprising:

a pair of flexible substrates;

a plurality of electrically conductive contacts disposed on opposing faces of said pair of flexible substrates, said conductive contacts having a thickness sufficient to permit said module to operate using currents in the range of about 6 amps to about 15 amps; and

a plurality of P-type and N-type thermoelectric elements interposed between said pair of substrates, each of said plurality of conductive contacts connecting adjacent P-type and N-type thermoelectric elements to each other in series and wherein each of said P-type and N-type elements has a first end connected to one of said conductive contacts of one of said substrates and a second end connected to one of said conductive contacts of the other of said substrates.

16. The module of Claim 15 further comprising a thermally conductive layer disposed on an outside surface of each of said pair of substrates.

17. The module of Claim 16 wherein said conductive layer forms a plurality of thermally-conductive contact points that spatially coincide with the areas covered by said plurality of conductive contacts on said opposing faces of said pair of substrates.

18. The module of Claim 16 wherein said conductive layer is thinner than said conductive contacts.

19. The module of Claim 15 wherein said conductive contacts have a thickness equal to or greater than 0.003 inch.

20. The module of Claim 19 wherein said conductive contacts have a thickness of about 0.012 inch.

21. The module of Claim 15 wherein said flexible substrate has a dielectric strength of about 500 V or more.

22. The module of Claim 15 wherein said flexible substrate is selected from the group of materials consisting of polyimide and epoxy resin.

23. The thermoelectric module of Claim 16 wherein said thermally conductive layer has a thickness that permits said flexible substrate to remain flexible.

24. The thermoelectric module of Claim 15 further comprising a diffusion barrier between said plurality of conductive contacts and said first and second ends of said plurality of P-type and N-type elements.

25. The thermoelectric module of Claim 24 wherein said diffusion barrier is made of a material selected from the group consisting of nickel, a titanium/tungsten mix, molybdenum, and other known diffusion barrier materials.

26. The module of Claim 15 wherein said flexible substrate has a thickness in the range of about 0.0005 inches to about 0.002 inches.

27. A method of making a flexible thermoelectric module comprising:

obtaining a pair of flexible substrates, each substrate having a plurality of electrical contacts disposed on one side; and

electrically connecting a plurality of P-type and N-type thermoelectric elements between opposing sides having said plurality of electrical contacts of said pair of flexible substrates wherein each of said plurality of electrical contacts connects adjacent P-type and N-type elements to each other in series wherein each of said P-type and N-type elements has a first end connected to one of said plurality of electrical contacts of one of said substrates and a second end connected to one of said plurality of electrical contacts of the other of said substrates.

28. The method of Claim 27 wherein said step of obtaining a pair of flexible substrates further includes a thermally conductive layer on the other side of said substrates.

29. The method of Claim 28 wherein said method further including said thermally conductive layer on one side of said substrate shaped to have thermal contact points that coincide with the pattern of said plurality of electrical contacts on the other side of said substrate.

30. The method of Claim 27 further comprising disposing a diffusion barrier between said electrical contacts and said first and second ends of said plurality of P-type and N-type elements.

31. A method of making a flexible thermoelectric module, said method comprising:

obtaining a pair of flexible substrates;

disposing an electrically conductive layer on at least one side of each of said pair of flexible substrates wherein said conductive layer thickness is equal to or greater than 0.003 inch;

etching said conductive layer of each of said pair of flexible substrates forming a plurality of electrical pads;

electrically connecting a plurality of P-type and N-type thermoelectric elements between opposing sides of said pair of flexible substrates having said plurality of electrical pads wherein each of said plurality of electrical pads connects adjacent P-type and N-type elements to each other in series wherein each of said P-type and N-type elements has a first end connected to one of said plurality of electrical pads of one of said substrates and a second end connected to one of said plurality of electrical pads of the other of said substrates.

32. The method of Claim 31 further comprising disposing a thermally conductive layer on the other side of each of said pair of flexible substrates.

33. The method of Claim 32 wherein said method further comprising etching said thermally conductive layer in a pattern to coincide with said plurality of electrical pads on the other side of said substrate.

34. The method of Claim 31 further comprising disposing a diffusion barrier between said electrical pads and said first and second ends of said plurality of P-type and N-type elements.

35. A method of making a flexible thermoelectric module comprising:

obtaining a pair of flexible substrates, each substrate having a plurality of electrical contacts disposed on one side, said electrical contacts having a thickness capable of supporting current densities in the range of about 6 amps to about 15 amps; and

electrically connecting a plurality of P-type and N-type thermoelectric elements between opposing sides having said plurality of electrical contacts of said pair of flexible substrates wherein each of said plurality of electrical contacts connects adjacent P-type and N-type elements to each other in series wherein each of said P-type and N-type elements has a first end connected to one of said plurality of electrical contacts of one of said substrates and a second end connected to one of said plurality of electrical contacts of the other of said substrates.

36. The method of Claim 35 wherein said obtaining step includes obtaining substrates having a thermally conductive layer on the other side.

37. The method of Claim 36 wherein said method further including said thermally conductive layer shaped to have thermal contact points in a pattern to coincide with said plurality of electrical pads on the other side of said substrate.

38. The method of Claim 35 further comprising disposing a diffusion barrier between said electrical pads and said first and second ends of said plurality of P-type and N-type elements.